

mating them. Therefore, physicians should encourage persons with handicaps not only to be aware of their vulnerability but also to take sensible precautionary steps for their own safety.

Self-defense training for disabled persons is becoming increasingly available through medical rehabilitation centers, community crime prevention groups, and martial arts classes. Three major types of defense are prevention, psychological defense, and physical defense. Prevention occurs through precautions to reduce vulnerability at home, work, school, on the street, while traveling, and through social encounters. Along with prevention, psychological preparation is important—thinking through what to do in a given situation, knowing the options, assessing one's abilities and limitations, avoiding looking or acting like a victim, acting assertive and confident, and identifying resources in the community for the development of preventive measures. Surprise is an assailant's advantage; that advantage can be reduced by practicing, both mentally and physically, what to do in a physically threatening situation. As for physical defense, there are two main theories of how to respond to an assault: some say talk, some say fight. Talk can be used to delay until an opportunity for help or escape is evident. Physical resistance against a firearm is never recommended. Otherwise, current consensus favors being prepared and practicing for an assault situation so that the first two or three moves can be sufficiently devastating to provide time to escape, seek help, or sound an alarm. With this as a goal, self-defense training for wheelchair users and persons with other disabilities has already proved effective.

Some rehabilitation centers offer classes in martial arts such as judo, jujitsu, kung fu, and karate. The practice of routines of self-defense develops the mind to react instantly to threatening situations and teaches persons not to try to stand firm and oppose an attack but to apply the principles of physics and kinesiology to use an opponent's force to convert an attack into a defeat. Although the best defense remains the avoidance of risky situations, if ever a disabled person is under physical attack, martial arts offer an effective means of training for self-protection and survival.

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Neuropharmacologic Interventions in Traumatic Brain Injury

ADVANCES HAVE OCCURRED in the past decade in the rehabilitation of patients with traumatic brain injury that have altered the approach to this condition. Treatment has been extended, moved out of hospital settings, and directed toward cognitive, behavioral, and social as well as physical deficits. Neuropharmacologic management is a second and complementary innovative approach that offers additional benefits to survivors of brain injury. Nearly all investigation in the past of the pharmacologic treatment of traumatic brain injury was concerned with the acute phase of the injury. The goal of such treatment has been to prevent im-

mediate complications, to minimize the severity of the initial injury, or to manage severe or emergency behavioral disturbance (violence). Neuropharmacologic methods had not been developed to manage the irreducible chronic behavioral and cognitive losses of brain impairment.

With a recognition that behavioral and cognitive deficits of brain injury constitute the greatest barrier to maximal independence, the possibilities of neuropharmacologic methods to ameliorate these chronic deficits have become evident. The goal of such treatment is to suppress undesirable behavior and augment adaptive behaviors. Traumatic brain injury produces specific—but to a large extent unknown—neurophysiologic (including neurotransmitter) disturbance. This disturbance contributes to a variety of functional deficits, including frontal, temporal, and information processing. Theoretically, it seems rational to administer agents that act to counter transmitter deficits or imbalances, remediating the internal milieu of the damaged brain, and thus to some extent “normalizing” brain activity.

It is appropriate to consider these psychopharmacologic approaches in at least four clinical situations or syndromes. These are decreased arousal, hyperarousal and agitation or aggression, affective disturbance, and cognitive impairment. Stimulants and dopaminergic agonists are most often reported useful for underaroused patients. A large and growing list of potentially useful agents is available for hyperaroused or aggressive patients, including the high-potency neuroleptic agents (traditionally the agent of choice for this indication), lithium carbonate, β -blockers, anticonvulsants (especially carbamazepine), tricyclic (and other) antidepressants, stimulants, and antianxiety agents. For affectively depressed patients, antidepressant drugs are appropriate. The diagnosis of depression in this organically impaired population is a challenge, however, as patients' internal mood states may be inaccessible because of aphasia, agnosia, or frontal impairment. Biologic signs of depression such as psychomotor retardation; sleep, sexual, and appetitive disturbance; and weight loss may all reflect direct deficits of the neurologic injury itself, thus confounding diagnosis. Secondary mania and hypomanic states also clearly result from brain injury and appear to respond to the use of lithium and carbamazepine.

Cognitive disorders are the most common and important deficits in patients with traumatic brain injuries. Because impaired cognition is an almost universal consequence of brain trauma and because even modest gains could have tremendous functional consequences, further investigation is warranted of potential clinical benefits of agents such as stimulants, antidepressants, dopaminergic agonists, neuropeptides, and other drugs reputed to enhance cognitive activity, such as piracetam.

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